The MC25-11Ex0-Pi is a rotational speed monitor that evaluates and converts pulse strings (i.e., from rotating parts, motors, gears or turbines) into standard current signals (0/4...20 mA).

An additional pulse output supplies the input pulse divided by a factor adjustment.

A display in the front of the device indicates the actual speed even if in excess of the preset range.

This unit can accommodate the following input devices:
- one intrinsically safe NAMUR input with monitoring for wire-break and short-circuit condition (II), or
- one non intrinsically safe 24 VDC input without input monitoring function (I).

The type of input device is selected at the time of programming.

Additional control devices can be operated via a short-circuit protected pulse output (d6). This terminal is also used as the input for pnp 3-wire sensors if NAMUR devices are not used.
Rotational Speed and Motion Controls

The intrinsically NAMUR input circuit is monitored for wire-break and short-circuit conditions. During a malfunction, an "err" (Error) message will flash on the four digit display and the green "Power" LED changes to red.

The parameters for the current monitoring functions during a wire-break or a short are programmable. When a fault in the input circuit occurs, the current output is either 0 mA or ≥ 22 mA.

This unit operates on the digital pulse principle which provides very short response times. To generate the output signal it measures the time between two consecutive input pulses. The next pulse updates the output signal.

The output signal is updated whenever the last measured digital pulse is exceeded or when pulses are suddenly missing. This means if no pulses are received, the output signal continuously drops to 0/4 mA relative to the overrange time of the last measured digital pulse.

To steady the input signal, an attenuation constant can be set between 1 and 30. When the constant is set to 1 (1 pulse), no signal attenuation takes place. The attenuation principle is based upon the floating average from the adjusted (preprogrammed) number of pulses.

In addition to the signal attenuation, an extra range factor (scaling factor) can be set to divide the input signal. The range factor is a divisor for the input signal adjustable from 2...2000. The scaled down signal is sent to the pnp output d8. (The display shows the actual frequency without considering the range factor). The pulse output transfers the input signal at a 1:1 pulse ratio. Input pulses are only scaled down to a maximum input frequency of 1.4 kHz.

Card parameter programming is accomplished either with two toggle switches in the front, or with personal computer (PC). The following parameters can be preselected to display:

- upper limit of range
- lower limit of range
- current output 0...20 mA/4...20 mA
- NAMUR input/pnp input
- analogue output function during fault condition: 0 mA/≥ 22 mA
- attenuation constant
- range (scaling) factor for pulse output d8

The selected parameter is indicated by front LEDs. The value of the parameter will be displayed on the four digit display.
**Type**
Ident-No. MC25-11Ex0-P/24VDC

<table>
<thead>
<tr>
<th>Supply Voltage $U_B$</th>
<th>20.4...27.6 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ripple $W_{pp}$</td>
<td>$\leq 10%$</td>
</tr>
<tr>
<td>Power/Current consumption</td>
<td>$&lt;200,\text{mA}$</td>
</tr>
<tr>
<td>Galvanic isolation</td>
<td>between input circuit, output circuit and supply voltage for 250 V$<em>{rms}$, test voltage 2.5 kHz$</em>{rms}$</td>
</tr>
</tbody>
</table>

**Input Circuit**
- NAMUR input (zd32) intrinsically safe per EN 50014/20 for NAMUR sensors
- 24 VDC input (d6) for 3-wire sensors, mechanical contacts
- Overrange protection NAMUR input: up to 3 kHz; 24 VDC input: up to 4 kHz

**Output Circuits**
- Current output 0/4...20 mA (load $\leq 600\,\Omega$)
- Pulse output for scaled input signal transistor output: pnp, short-circuit protected ($I_L \leq 50\,\text{mA}$)
- Additional pulse output transistor output: pnp, short-circuit protected ($I_L \leq 50\,\text{mA}$)

**Interface**
RS232 serial/V.24 via adapter MC-IM-232

**Ex-Approval acc. to Certification of Conformity**
PTB No. Ex-86.B.2077X

**Input circuit**
- Maximum nominal values
  - No-load voltage $U_0$ 10.5 V
  - Short-circuit current $I_k$ 13.7 mA
- Maximum external inductances/capacitances [Ex ia] IIC 5 mH/550 nF

**Transfer Characteristics**
- Effective range 10 mHz...1.6 kHz (0.6...96 000 min$^{-1}$) upper and lower limit adjustable
- Linearity tolerance $\leq 0.1\%$ of final value (typically 0.03%)
- Effect of load impedance $\leq 0.01\%$ of final value
- Effect of supply voltage impedance negligible
- Ambient temperature sensitivity $\leq 0.005\% / \text{K}$ of final value

**LED Indications**
- Power “ON” (2-colour LED) green: device operating - red: fault
- Limit values green
- Programming mode for card parameters green
- Pulse indication yellow
- Display factor (“x 10”, “÷ 10”) red
- Display red (4 digits)

**Eurocard**
Material glass-fiber reinforced epoxy resin, quality class FR4
Front panel plastic, 4TE = 20.32 mm individually interlocking
Connection connector per DIN 41612, type F, 32-pole (series z+d)
Operating temperature -25...+60 °C

**Coding No. 15**

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Hans Turck GmbH & Co. KG • Postfach • D-45466 Mühlheim an der Ruhr • Tel. 02 08/49 52-0 • Fax 02 08/49 52-264